

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 17

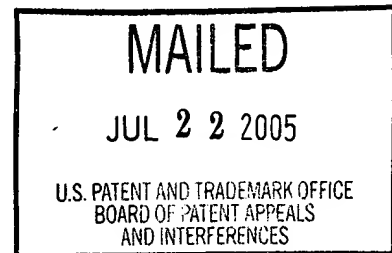
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte RANJIT J. ROZARIO and RAVIKRISHNA CHERUKURI

Appeal No. 2005-0973
Application No. 09/740,669

ON BRIEF



Before KRASS, RUGGIERO and BARRY, Administrative Patent Judges.

KRASS, Administrative Patent Judge.

Decision On Appeal

This is a decision on appeal from the final rejection of claims 1-24.

The invention is directed to a direct memory access (DMA) scheduler, best illustrated by representative independent claims 1 and 10, reproduced as follows:

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1. An apparatus for scheduling a Direct Memory Access (DMA) device having multiple channels, comprising:

a shift structure having a plurality of entries corresponding to the multiple channels to be scheduled, wherein each entry in said shift structure includes a plurality of fields, and wherein each entry includes a weight that is determined based on said plurality of fields; and

a comparison-logic circuit configured to sort said entries based on their respective weights.

10. A method of scheduling multiple channels on a Direct Memory Access (DMA) device, comprising:

writing a plurality of entries in a shift structure, wherein each entry is associated with a channel on the DMA, and wherein each entry includes a plurality of fields;

assigning weights to said entries based on said plurality of fields;

sorting said entries based on said weights, wherein an entry having the highest weight is sorted to the head of said shift structure; and

reading said entry from the head of said shift structure to service the channel associated with said entry.

The examiner relies on the following references:

| | | |
|--------------------|-----------|---------------|
| Lee et al. (Lee) | 5,504,919 | Apr. 2, 1996 |
| Bass et al. (Bass) | 6,052,375 | Apr. 18, 2000 |

Claims 5-8, and 14-18 stand rejected under 35 U.S.C. § 112, first paragraph, as relying on a non-enabling disclosure.

Claim 9 stands rejected under 35 U.S.C. § 101 as being inoperative and lacking utility.

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Claims 1-4, 10-13, and 19-24 stand rejected under 35 U.S.C. § 103 as unpatentable over Lee in view of Bass.

Reference is made to the brief and answer for the respective positions of appellants and the examiner.

OPINION

Turning, first, to the rejection of claims 5-8, and 14-18 under 35 U.S.C. § 112, first paragraph, "as a matter of Patent and Trademark Office practice, a specification disclosure which contains a teaching of the manner and process of making and using the invention in terms which correspond in scope to those used in describing and defining the subject matter sought to be patented *must* be taken as in compliance with the enabling requirement of the first paragraph of 35 U.S.C. 112 *unless* there is reason to doubt the objective truth of the statements contained therein which must be relied on for enabling support." Assuming that sufficient reason for such doubt does exist, a rejection for failure to teach how to make and/or use will be proper on that basis; such a rejection can be overcome by suitable proofs indicating that the teaching contained in the specification is truly enabling, In re Marzucchi, 439 F.2d 220, 169 USPQ 367 (CCPA 1971); In re Sichert, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977).

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In the instant case, the examiner contends that the term, "in-flight," as in the claimed "in-flight field," is not established in the art and that the artisan would be unable to assign an "in-flight field" without further detail as to what this encompasses.

Claims 5 and 14 list fields which are included in the plurality of fields which are in each entry in the shift structure. One of those fields listed is "an in-flight field." Page 14 of the specification specifies that a packet is "in-flight when the packet is being processed, such as if a packet is being read out of memory, being sent out onto the bus, and the like." Thus, the "in-flight field" indicates if a packet is in-flight, as defined in the specification. Since the specification teaches what is in the in-flight field, and we find no reason to doubt what has been described in the specification, and claimed, we will not sustain the rejection of claims 5-8, and 14-18 under 35 U.S.C. § 112, first paragraph.

The examiner bases the rejection on a notion that appellants describe a packet as in-flight and, at the same time, scheduled in the DMA, and that this is inconsistent. However, we agree with appellants, for the reasons set forth at page 5 of the brief, that there is no inconsistency and that an example shows

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that "when the DMA is a component of a line card connected to a bus, an in-flight packet can be a packet that is being sent out on the bus by the line card. However, before the in-flight packet is sent out on the bus, the in-flight packet can be first scheduled in the DMA on the line card."

Since the examiner has not convinced us of a reasonable challenge to the instant disclosure, we do not sustain the rejection of claims 5-8, and 14-18 under 35 U.S.C. § 112, first paragraph.

Turning to the rejection under 35 U.S.C. § 101, the examiner contends that claim 9 describes an invention that is inoperative and therefore lacks utility. In particular, the examiner asserts that the shifting structure could not be embodied as a FIFO device because a "FIFO device by definition is processed in a very linear fashion. The first object added is the first object removed, not allowing for shifting, or sorting" (answer-page 4).

In order to support a rejection based upon an alleged lack of § 101 utility, the examiner must demonstrate that the claimed subject matter is totally incapable of achieving any useful result. Note Brooktree Corp. v. Advanced Micro Devices, Inc., 977 F.2d 1555, 1571, 24 USPQ2d 1401, 1412 (Fed. Cir. 1992). In the instant case, the examiner has not demonstrated this.

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While the examiner asserts that a FIFO does not allow for "shifting or sorting," a FIFO does, indeed, allow for shifting. Clearly, as a new piece of data enters the FIFO device, all other data is shifted over, as the first entered data is shifted out. For example, if one has a full four-bit FIFO device, such that cells comprise 0-1-1-0 and a new piece of data is input, say 1, then the 0 gets shifted out (it was the first in so it is the first out) and the new data is now 1-0-1-1, comprising a "shift." Thus, in our view, the examiner has not clearly demonstrated that the subject matter of claim 9 is totally incapable of achieving any useful result.

Accordingly, we will not sustain the rejection of claim 9 under 35 U.S.C. § 101.

Finally, we turn to the rejection of claims 1-4, 10-13, and 19-24 under 35 U.S.C. § 103.

With regard to independent claim 1, it is the examiner's position that Lee teaches a shift structure having a plurality of entries, and a comparison logic circuit to sort the entries based on their respective weights (abstract/Figure 2). The examiner acknowledges that Lee does not teach the plurality of entries having a plurality of fields, or that the entries are DMA channels. However, the examiner turns to Bass for an alleged

teaching of a scheduler for DMA channel transfers. Specifically, the examiner refers to column 4, line 46, through column 5, line 38, for a teaching of a plurality of fields in a parameter table, and to column 5, lines 42-44, for queues that are sorted for output to a traffic queue allocation manager. Moreover, the examiner contends that Bass teaches a DMA bus arbitration based on a straight priority fashion, at column 5, lines 60-64.

The examiner contends that while Bass does not use the term "weights," it would have been obvious that the terms "weight" and "priority" are interchangeable in this context because both words indicate an importance or superiority in relation to competing entities. Thus, the examiner concludes, it would have been obvious to combine the DMA scheduler of Bass with the shift structure of Lee "in order to increase the speed of arbitration by increasing sorting efficiency" (answer-page 5).

For their part, appellants contend that while Bass may disclose fields in a parameter table, instant independent claims 1, 10, and 19 each recite that each entry in said shift structure includes a plurality of fields. Appellants contrast this limitation with Figures 1 and 9 of Bass, wherein the parameters in TSPT 7 are not fields in an entry of queues Q0-Q31, and the

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parameters contained in TSPT 7 of Figure 8 relate to the queues and not to the entries in the queues (brief-pages 6-7).

We agree with appellants. First, we are not convinced that the examiner has established a reason to combine the applied references since the sorter structure of Lee appears unrelated to the traffic shaping in the internetworking device of Bass. But, in any event, as shown in Figure 1 of Bass, the TSPT 7 is separate from the queues Q0-Q31. Therefore, while there are certain entries into the queues, it appears clear that the TSPT is not the source of these entries into the queues. Since the TSPT is relied on by the examiner for providing a plurality of fields (pointing to the functions of different parameters laid out at column 4, line 60 through column 5, line 38), it is clear that any plurality of fields resident in the TSPT is not part of the entries into the queues. Yet, the instant claims require that each "entry" in a shift structure "includes a plurality of fields."

Accordingly, for at least this reason, we find no prima facie case of obviousness established by the examiner. Therefore, we will not sustain the rejection of claims 1-4, 10-13, and 19-24 under 35 U.S.C. § 103.

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CONCLUSION

We have not sustained any one of the rejections of claims 5-8, and 14-18 under 35 U.S.C. § 112, of claim 9 under 35 U.S.C. § 101, or of claims 1-4, 10-13, and 19-24 under 35 U.S.C. § 103.

Accordingly, the examiner's decision is reversed.

REVERSED



ERROL A. KRASS
Administrative Patent Judge



JOSEPH F. RUGGIERO
Administrative Patent Judge

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BARRY, Administrative Patent Judge, concurring.

I concur in the results reached by my colleagues. Regarding the reversal of the enablement rejection, however, I reach the result via a different path. In addressing the enablement rejection, the Board conducts a two-step analysis. First, we construe the claims at issue to determine their scope. Second, we determine whether the construed claims would have been enabled.

I. CLAIM CONSTRUCTION

"Analysis begins with a key legal question – *what is the invention claimed?*" *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1567, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987). Here, claims 5 and 14 list fields constituting an entry in a shift structure. In particular, the claims recite "an in-flight field."

II. ENABLEMENT DETERMINATION

Having determined what subject matter is being claimed, the next inquiry is whether the subject matter would have been enabled. "[T]he PTO bears an initial burden of setting forth a reasonable explanation . . . why it believes that the scope of protection provided by that claim is not adequately enabled by the description of the invention provided in the specification of the application. . . ." *In re Wright*, 999 F.2d 1557, 1561-62, 27 USPQ2d 1510, 1513

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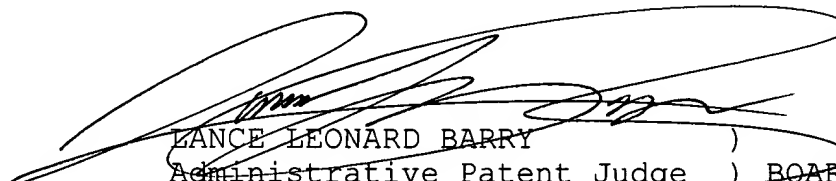
(Fed. Cir. 1993). More specifically, "[t]o be enabling under §112, a patent must contain a description that enables one skilled in the art to make and use the claimed invention." *Atlas Powder Co. v. E. I. Du Pont de Nemours & Co.*, 750 F.2d 1569, 1576, 224 USPQ 409, 413 (Fed. Cir. 1984) (citing *Raytheon Co. v. Roper Corp.*, 724 F.2d 951, 960, 220 USPQ 592, 599 (Fed. Cir. 1983)). "That some experimentation is necessary does not preclude enablement; the amount of experimentation, however, must not be unduly extensive." *Id.*, 224 USPQ at 413.

Here, the appellants' specification discloses that "[p]acket-in-flight field 624 can be configured to indicate if a packet is in-flight." (Spec. at 14.) The specification adds that "[a] packet is considered to be in-flight when the packet is being processed, such as if a packet is being read out of memory, being sent out onto the bus, and the like." (*Id.*)

In view of the aforementioned disclosures, I conclude that one skilled in the art would have understood that the claimed "in-flight field" indicates whether a packet is being processed. With such an understanding, I am unpersuaded that such a one would have been unable to make and use, without undue experimentation,

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such a field. Therefore, I concur in the reversal of the lack of enablement rejection of claims 5 and 14.


LANCE LEONARD BARRY)
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